Canceled 0-63

UNITED STATES COAST GUARD

ADDRESS REPLY TO:
COMMANDANT
U. S. COAST GUARD
HEADQUARTERS
WASHINGTON 25, D. C.

·MMT
25 November 1959

NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 5-59

·Subj: Small Passenger Vessels - Subchapter T - Simplified Procedure for Determining Compliance With Parts 178 and 179, Watertight Subdivision and Stability (amends NVC 4-57).

1. Purpose. This circular sets forth procedures which permit determination of Subdivision and Stability without necessity for the usual detailed calculations and related plans.

2. Directive Affected. To the extent that the procedures herein given amend or amplify the provisions of Navigation and Vessel Inspection Circular No. 4-57, it supersedes that circular.

3. Application. These procedures may be applied to existing vessels, propelled by machinery or non-self propelled, carrying not more than 150 passengers and which have not yet been brought into compliance with the requirements of Parts 178 and 179. However, in cases where the Officer in Charge, Marine Inspection considers these procedures to be inadequate, or where an owner may so desire, adequacy of stability and subdivision shall be checked in accordance with usual Naval Architectural procedures, as contemplated by Parts 178 and 179.

4. Plans Required. Where the following simplified procedures are used, Lines and Offsets, Curves of Form, Capacities of Tanks, Floodable Length Calculations, and Damaged Stability Calculations are not required. An accurate Outboard Profile Plan or sketch showing all erections is required and an accurate plan or sketch showing the location of watertight bulkheads will facilitate necessary work. No other plans are required unless needed to determine adequacy of structure, machinery, or electrical systems.

5. Effective date. Upon receipt.

Encl: (1) Simplified Subdivision and Stability Procedure

Dist. (SDL No. 69)
A: None
B: e(35); c(10); l(3); p(1)
C: m(4); o(2)
D: i k(1)
E: m(1)
Lists 112, 155, 135

C. H. BROACH
CAPT, U. S. Coast Guard
Acting Chief, Office of Merchant Marine Safety
By direction of the Commandant

20134 TREAS. CGHQ. WASH., D.C.

ENCLOSURE (1) TO NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 5-59
SIMPLIFIED SUBDIVISION AND STABILITY PROCEDURE

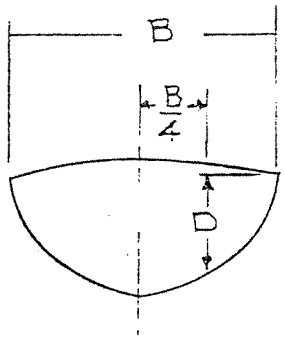
1. Subpart 178.15 - Subdivision and Damaged Stability Calculations

In lieu of complying with Subpart 178.15, the watertight subdivision of existing vessels, propelled by machinery or non-self propelled, and carrying not more than 150 passengers, may be checked by application of the following formula. If the actual spacing of watertight bulkheads does not exceed the related maximum permissible compartment lengths so calculated the subdivision may be accepted as satisfactory.

$$l = F \times f \times \frac{L}{D}$$

where: $l$ = The maximum permissible length of the compartment in feet, except that, in no case, is this length to exceed one-third of the length of the vessel measured over the bulkhead deck.

$f$ = Effective freeboard in feet. This is the mean of the freeboards measured from the load waterline to the top of the bulkhead deck at the side in way of the bulkheads bounding the compartment concerned. For vessels having a raised deck forward the height measurement in way of bulkheads forward of the break shall be taken to a straight line extending from the break to the raised deck at the bow.



Measurement of Depth

$\frac{L}{D}$ = Length-Depth Factor. This is the length of the vessel in feet, measured over the bulkhead deck, divided by the depth, in feet, measured amidships of the vessel at a point one-quarter of the beam out from the centerline, from the inside of the planking or plating to the level of the top of the bulkhead deck at the side.

$F$ = Floodable Length Factor for the compartment as listed in the following Table:

| MIDPOINT OF COMPARTMENT IN % LENGTH FROM BOW | FLOODABLE LENGTH FACTOR |
|---|---|
| 0-10 | .33 |
| 15 | .33 |
| 20 | .34 |
| 25 | .36 |
| 30 | .38 |
| 35 | .43 |
| 40 | .48 |
| 45 | .54 |
| 50 | .61 |
| 55 | .63 |
| 60 | .58 |
| 65 | .53 |
| 70 | .48 |
| 75 | .44 |
| 80 | .40 |
| 85 | .37 |
| 90-100 | .34 |

SIMPLIFIED SUBDIVISION AND STABILITY PROCEDURE

2. Subpart 179.10, Section 179.10-1 - Plans required and Subpart 179.15 - Stability Standards

In lieu of complying with Subpart 179.10, Section 179.10-1 and with Subpart 179.15, the stability of existing vessels, propelled by machinery or non-self propelled, and carrying not more than 150 passengers, may be checked by application of the following procedure:

(a) The vessel is to be complete in all respects. Ballast, if necessary, is to be of the permanent, fixed type and is to be on board and in place. Fuel and water tanks are to be approximately three-quarters full.

(b) The weight of the passengers and other load, if any, is to be simulated by equivalent deadweight distributed so as to provide normal trim and to simulate the most unfavorable vertical center of gravity likely to occur in service.

(c) On vessels having non-return closures on cockpit scuppers or on weather deck drains, such closures shall be restrained in the open position during the course of the test.

(d) For the purposes of this part, the weight per passenger shall be taken at 160 pounds except that on protected waters, a weight per passenger of 140 pounds may be used when the passenger load consists of men, women, and children.

(e) With deadweight on board equivalent to the total passenger and other load, if any, the vessel shall not exceed the limitations on hull immersion and angle of list set forth in subparagraphs (f) and (g), when subjected to the greater of the following heeling moments:

(1) $M_p = \frac{W \times B_p}{6}$

where: $M_p$ = Passenger Heeling Moment in foot pounds.

$W$ = Total weight of Passengers in pounds.

$B_p$ = Maximum beam of vessel which is accessible to the passengers, in feet.

(2) $M_W = P \times A \times H$

where: $M_W$ = Wind heeling moment in foot pounds.

$P$ = Wind pressure factor in pounds per square foot, in accordance with the following:

7.5 for Protected Waters
10.0 for Partially-Protected Waters
15.0 for Exposed Waters

$A$ = Area, in square feet, of the projected lateral surface of the vessel above the load waterline. This surface includes the hull, superstructure and areas bounded by railings and/or structural canopies.

$H$ = Height, in feet, to the center of area (A) above the load waterline. For purposes of determining A and H, an accurate Outboard Profile Plan or sketch is required.

(f) When subjected to the required heeling moment, the immersion of the hull due to heel, measured in way of the least freeboard (or at a point three-quarters of the length of the vessel from the bow if the least freeboard is aft of this point) shall not exceed the following, as applicable:

1. On flush deck vessels the freeboard shall be measured to the top of the weather deck at the side and the immersion shall not be more than one-half of this freeboard.

2. On cockpit boats the freeboard shall be measured to the top of the gunwale. The maximum allowable immersion shall be determined as follows:

$$\text{Maximum Allowable Immersion (Exposed Waters)} = \frac{f\,(2L - 1.5\ell)}{4L}$$

$$\text{Maximum Allowable Immersion (Partially-Protected or Protected Waters)} = \frac{f\,(2L - \ell)}{4L}$$

where: $f$ = Freeboard in feet

$L$ = Length of vessel in feet, measured over the bulkhead deck.

$\ell$ = Length of cockpit in feet.

3. On open boats the freeboard shall be measured to the top of the gunwale and the maximum allowable immersion shall be one-quarter of this freeboard.

(g) In addition to meeting the foregoing heel limits when subjected to the required heeling moment, the maximum angle of list shall not exceed 14 degrees.

(h) Vessels carrying vehicular loads, in addition to complying with the other provisions given herein, shall be tested to determine that maximum trim or list during loading or unloading of vehicles will not be excessive.

(i) During loading and moving of tests weights care should be taken whenever there is evidence of low stability. This may be taken to be the case whenever the effect of any added or shifted weight increment is noted to be more than that of a preceding increment of the same size.

(j) For the purposes of these calculations the following definitions apply:

Exposed waters - In general, exposed waters are all waters more than 20 miles from the mouth of a harbor of safe refuge and, also, any waters where, in the judgment of the Officer in Charge, Marine Inspection, local conditions of sea, or weather, or other circumstances create a special hazard requiring the maximum degree of seaworthiness afforded by these regulations.

Partially protected waters - In general, partially-protected waters are all waters within a radius of 20 miles from the mouth of a harbor of safe refuge.

Protected waters - In general, protected waters are the waters of rivers, harbors and sheltered lakes.